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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/747,933	12/27/2000	Tatsuya Igarashi	Q62491	3460

7590 11/05/2003

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Washington, DC 20037

EXAMINER
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YAMNITZKY, MARIE ROSE

ART UNIT	PAPER NUMBER
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1774

DATE MAILED: 11/05/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/747,933

Applicant(s)

IGARASHI ET AL.

Examiner

Marie R. Yamnitzky

Art Unit

1774

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 18 August 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 5-7 and 10-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 22 and 23 is/are allowed.
- 6) ☒ Claim(s) 5-7, 10-14, 18-21 and 24-26 is/are rejected.
- 7) ☒ Claim(s) 15-17 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                             | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s) _____   |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other:  |

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1. This Office action is in response to applicants' amendment filed August 18, 2003 (Paper No. 8), which amends claims 5, 10, 14 and 15, and adds claims 18-26.

The examiner acknowledges receipt of certified translations filed August 18, 2003 for Japanese foreign priority applications 2000-89274 (foreign filing date: March 28, 2000) and 11-370349 (foreign filing date: December 27, 1999).

The examiner acknowledges receipt of a Rule 132 Declaration by Tatsuya Igarashi filed August 18, 2003.

Claims 5-7 and 10-26 are pending.

2. In view of the certified translation of JP 2000-89274, copending application 09/695,978 (now U.S. Patent No. 6,635,364) is withdrawn as prior art with respect to devices comprising a compound having a partial structure represented by formula (21).

In view of the certified translation of JP 2000-89274, the published applications of Grushin et al. (US 2002/012638 A1) and Thompson et al. (US 2002/0034656 A1) are withdrawn as prior art with respect to devices comprising a compound having a partial structure represented by formula (21).

In view of the certified translation of JP 11-370349, the published applications of Grushin et al. (US 2002/012638 A1) and Thompson et al. (US 2002/0034656 A1) are withdrawn as prior art with respect to devices comprising a compound having a partial structure represented by formula (9) or (19).

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3. Claim 25 is rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. Claims which fail to recite features that are critical or essential to the practice of the invention are not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). In the present case, claim 25 fails to recite that the light-emitting layer or plurality of layers containing a light-emitting is interposed between a pair of electrodes.

4. Claims 5-7, 10-14 and 18-21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The scope of the light-emitting material as defined in claim 5 is confusing because of the use of the term "and" in the phrase "having a partial structure represented by formula "(4) to (7) and (9), (22) or a tautomer thereof", and because there is a formula (20) set forth in claim 5 that is not referenced elsewhere in the claim. It is not clear if the light-emitting material required by claim 5 may have a partial structure represented by formula (20). It is not clear if the light-emitting material required by claim 5 must have a partial structure represented by one of formula (4) to (7) and at the same time must have a partial structure represented by one of formula (9), [(20),] (22) or a tautomer thereof, or if the partial structure is represented by one of formula (4) to (7), (9), [(20),] (22) or a tautomer thereof.

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5. For purposes of comparing to the prior art, claims 5-7, 10-14 and 18-21 are interpreted as allowing the light-emitting material to have a partial structure represented by formula (4)-(7), (9), (20), (22) or a tautomer thereof.

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claim 24 is rejected under 35 U.S.C. 102(e) as being anticipated by Grushin et al. (US 2002/012638 A1).

Grushin et al. disclose iridium compounds suitable for use in the light-emitting layer of an organic electroluminescent device. Grushin et al. disclose iridium compounds meeting the limitations of the light-emitting material required by the present claims. See the whole document, in particular, see paragraphs [0008]-[0021], [0027], [0031]-[0038], [0044]-[0049], [0063]-[0064] and claims 1, 2 and 10-18.

Grushin's compound 1-m, for example, is a compound having a partial structure represented by present formula (8) wherein  $X^{204}$  represents a nitrogen atom, each of  $X^{201}$ ,  $X^{202}$  and  $X^{203}$  represents C-R, and  $Z^{201}$  represents an atomic group for forming an aryl ring.

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 5-7, 10-14 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thompson et al. (US 2002/0034656 A1) or Grushin et al. (US 2002/0121638 A1).

Thompson et al. and Grushin et al. disclose iridium complexes/compounds for use as light-emitting materials in organic light-emitting devices.

Thompson et al. do not provide a specific example of an iridium complex meeting the limitations of a light-emitting material having a partial structure represented by formula (20) as defined in present claim 5 or 26 but such complexes are clearly suggested by Thompson et al. For example, see paragraph [0052] and Fig. 49. The arylquinolines disclosed in Fig. 49 (which were also disclosed in Thompson's priority application 09/452,346) provide iridium complexes represented by formula (20) wherein m203 is from 1 to 3.

Grushin et al. do not provide a specific example of an iridium compound meeting the limitations of a light-emitting material having a partial structure represented by formula (20) as defined in present claim 5 or 26 but such complexes are clearly suggested by Grushin et al. For example, see paragraphs [0017]-[0021]. A ligand of Grushin's formula (I) wherein R<sup>1</sup> and R<sup>2</sup> join to form a ring such as a six-membered aromatic ring provides an iridium compound represented by formula (20) wherein Z<sup>201</sup> represents an atomic group for forming an aryl ring.

It would have been *prima facie* obvious to one of ordinary skill in the art at the time of the invention to make iridium complexes/compounds having ligands similar to those disclosed by Thompson et al. or by Grushin et al. with the expectation that such complexes/compounds would also be light-emitting and would be useful in the manufacture of organic light-emitting devices.

10. Applicants' arguments filed August 18, 2003 have been fully considered but they are not persuasive with respect to the patentability of the present claims encompassing embodiments in which the partial structure is represented by formula (20) as defined in present claims 5 or 26, or in which the partial structure is represented by formula (8) as defined in present claim 24.

Foreign priority applications 2000-89274 and 11-370349 provide insufficient support for light-emitting materials having a partial structure represented by present formula (8). Formula (8) is not disclosed in either of these applications, and no specific examples of compounds comprising a partial structure represented by formula (8) are disclosed. It is the examiner's position that the portions of the '349 application referenced by applicants as providing support for formula (8) are insufficient. Contrary to applicants' arguments, compound (1-12) on page 21 of the '349 translation is not within the scope of formula (8). In the compound having a structure represented by present formula (8), at least one of  $X^{201-204}$  must represent a nitrogen atom so that at least one of the rings is a heteroaryl 6-membered ring comprising two to five nitrogens in the ring. The heteroaryl 6-membered ring of compound (1-12) on page 21 of the '349 translation only comprises one nitrogen in the ring. Further, while the '349 application broadly teaches that

the orthometalated iridium complex may comprise a ligand which is an aryl group-substituted nitrogen-containing heterocyclic derivative, with a phenyl group being mentioned as one example for the aryl group and pyrimidine being mentioned as one of numerous examples for the heterocyclic group, this ligand is an optional ligand in a complex which must comprise at least one phenylthiophene, phenylpyridine or benzoquinoline ligand. Present formula (8) encompasses tris(phenylpyrimidine) iridium complexes, such as Grushin's compound 1-m, which are not supported by the '274 or '349 foreign priority applications.

Foreign priority applications 2000-89274 and 11-370349 provide insufficient support for light-emitting materials having a partial structure represented by present formula (20). Formula (20) is not disclosed in either of these applications, and no specific examples of compounds comprising a partial structure represented by formula (20) are disclosed.

With respect to applicants' arguments regarding present formula (20) and Thompson's teachings, Thompson's iridium complexes may consist of iridium and three arylquinoline ligands of the formula shown in Fig. 49. Such a complex meets the limitations of formula (20) as defined in present claims 5 and 26.

The examiner has considered the data set forth in the Rule 132 Declaration filed August 18, 2003 but is of the position that the data are insufficient to demonstrate superior/unexpected results compared to the closest prior art. With respect to the Thompson reference, each of the compounds of formula C, E and F is within the scope of Thompson's disclosure. With respect to the Grushin reference, each of the compounds of formula C, E and F is a compound having a partial structure represented by present formula (8) and is similar to compounds suggested by



Grushin. Grushin requires at least one fluorine or fluorinated group on the ligand which is not present in any of the compounds compared in the declaration. Even if compounds of formula C, E and F having a fluorine or fluorinated group on the phenylisoquinoline ligand were shown to provide results similar to those provided by C, E and F, the data would not be persuasive as to patentability because fluorinated derivatives of each of C, E and F are within the scope of Grushin's disclosure.

11. Claims 15-17 are objected to because of the following informalities: In the second line of claim 15, "is" should be deleted as a grammatical correction. Appropriate correction is required.

Claims 15-17 will be allowed upon correction of claim 15.

12. Claims 18-21 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

13. Claims 22 and 23 are allowed.

14. Claim 25 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, first paragraph, set forth in this Office action.

15. Miscellaneous:

The definition of formula (20) as set forth in claims 5 and 26 includes the phrase "coordinating number 6 or iridium". In view of applicants' remarks in Paper No. 8, "or" should read --of-- in this phrase.

In the first line after formula (8) in claim 24, "X<sup>20</sup>" should read --X<sup>203</sup>-- (compare to formula (8) as defined in original claim 5 and in claim 5 of the amendment filed December 26, 2002).

16. Applicants' amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicants are reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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17. Any inquiry concerning this communication should be directed to Marie R. Yamnitzky at telephone number (703) 308-4413. The examiner works a flexible schedule but can generally be reached at this number from 6:30 a.m. to 4:00 p.m. Monday, Tuesday, Thursday and Friday, and every other Wednesday from 6:30 a.m. to 3:00 p.m.

The current fax number for Art Unit 1774 is (703) 872-9306 for all official faxes. (Unofficial faxes to be sent directly to examiner Yamnitzky can be sent to (703) 872-9041.)

MRY  
November 03, 2003



MARIE YAMNITZKY  
PRIMARY EXAMINER

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